DRAFT

ENGINEERING EVALUATION
Elder Care Alliance of Union City
PLANT NO. 17037
APPLICATION NO. 12640

BACKGROUND

The Elder Care Alliance of Union City, California is applying for an Authority to Construct and/or Permit to Operate for the following equipment:

S-1 Stationary Standby Generator Set: Diesel Engine; Make: John Deere; Model: 4045HF275; Rated Horsepower: 157 HP

The standby generator will be located at 33883 Alvarado-Niles Road, Union City, CA 94587. This project lies within 1000 feet of two schools, Union City Christian Academy and James Logan High School, so it will trigger the Public Notification Process.

EMISSIONS SUMMARY

Annual Emissions:

The manufacturer-supplied five-point weighted average data of emission factors for S-1 (157 HP- diesel engine) are listed below.

Pollutant	Emission Factors (g/hp-hr)
	S-1
NOx	4.42
CO	0.75
POC	0.19
PM10	0.14
SO_2*	0.184*

**The emission factor for SO2 is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors.*

SO_2 8.09E-3 (% S in fuel oil) lb/hp-hr = 8.09E-3 (0.05% S) (454 g/lb) = 0.184 g/hp-hr

NOx	=	(4.42 g/hp-hr)	(157 hp)	(50 hr/yr)	(lb/454g)	=	76.4 lb/yr	= 0.038 TPY
CO	=	(0.75 g/hp-hr)	(157 hp)	(50 hr/yr)	(lb/454g)	=	13.0 lb/yr	= 0.006 TPY
POC	=	(0.19 g/hp-hr)	(157 hp)	(50 hr/yr)	(lb/454g)	=	3.29 lb/yr	= 0.002 TPY
PM10	=	(0.14 g/hp-hr)	(157 hp)	(50 hr/yr)	(lb/454g)	=	2.42 lb/yr	= 0.001 TPY
SO2	=	(0.184 g/hp-hr)	(157 hp)	(50 hr/yr)	(lb/454g)	=	3.18 lb/yr	= 0.002 TPY

Maximum Daily Emissions:

A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations.

For S-1:

NOx	=	(4.42 g/hp-hr)	(157 hp)	(24 hr/day)	(lb/454g)	=	36.9 lb/day
CO	=	(0.75 g/hp-hr)	(157 hp)	(24 hr/day)	(lb/454g)	=	7.37 lb/day
POC	=	(0.19 g/hp-hr)	(157 hp)	(24 hr/day)	(lb/454g)	=	1.84 lb/day
PM10	=	(0.14 g/hp-hr)	(157 hp)	(24 hr/day)	(lb/454g)	=	1.27 lb/day
SO2	=	(0.184 g/hp-hr)	(157 hp)	(24 hr/day)	(lb/454g)	=	1.65 lb/day

Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New	Total
NOx	0	0.038	0.038
CO	0	0.006	0.006
POC	0	0.002	0.002
PM10	0	0.001	0.001
SO2	0	0.002	0.002
NPOC	0	0.000	0.000

Toxic Risk Screening:
The toxic emission of diesel particulate exceeds the District Risk Screening Trigger, as shown in Table (1) below, and a Risk Screening Analysis has been performed.

Table 1. Calculated incremental increase in diesel exhaust particulate matter for S-1

Source:	PM_{10} Emission Factor (g/HP-hr)	HP	Annual Usage (Hours/year) [1]	Diesel Exhaust Particulate Emissions (lb/year):	Trigger Level (lb/yr)	Risk Screen Required? (Yes/No)
1	0.14	157	50	2.42	0.64	Yes

Per the attached 6/8/2005 memo from Ted Hull, results from the health risk screening analysis indicate that the cancer risk for the maximally exposed residential receptor is 4.1 in a million for 50 hours of operation per year, excluding periods when operation is required due to emergency conditions. Thus, in accordance with the District's Toxic Risk Management Policy, the screen passes.

The ISCST3 air dispersion computer model was used to estimate annual average ambient air concentrations. Stack and building parameters for the analysis were based on information provided by the applicant. Estimates of residential risk assume continuous 70-year exposure to annual average TAC concentrations.

PUBLIC COMMENT

[1] Annual Usage based on 50 hours per year of operation for reliability-related activities as prescribed by Subsection (E)(2)(A) of section 93115, title 17, California Code of Regulations.

The project is within 0.25 miles of two schools and therefore subject to the public notification requirements of Reg. 2-1-412. The public notice was posted on the Internet and mailed to all Parents or Guardians with children enrolled at Union City Christian Academy and James Logan High School. It was also mailed to all residential neighbors located within 1000 feet of the proposed new source of pollution. Please see the attached documentation for comments received via email and phone.

STATEMENT OF COMPLIANCE

The owner/operator of S-1 shall comply with Reg. 6 (Particulate Matter and Visible Emissions Standards) and Reg. 9-1-301 (Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations). Since this engine meets TBACT for PM10 (<0.15 g/hp-hr), it is expected to comply with Reg. 6. Low sulfur diesel (0.05wt%) will be used to meet the sulfur limitation of 0.5wt% in Reg. 9-1-304. Because S-1 is an emergency standby generator, Reg. 9-8-110 (Inorganic Gaseous Pollutants: Nitrogen Oxides from Stationary Internal Combustion Engines) exempts the requirements for emission limits of Sections 9-8-301, 302, and 502. Allowable operating hours and the corresponding record keeping in Reg. 9-8-330 and 530 will be included in the Permit Conditions below.

This diesel engine is subject to the Stationary Diesel Airborne Toxics Control Measure (ATCM) and is considered a new stationary emergency standby diesel engine since it will be installed after January 1, 2005 and is larger than 50 HP. The requirements of the ATCM will be included in the permit conditions.

The project is considered to be ministerial under the District's CEQA regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 2.3)

Best Available Control Technology:

In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NOx, CO, SO_2 or PM_{10}.

Based on the emission calculations above, the owner/operator of S-1 is subject to BACT for the following pollutant: NOx. BACT 1 levels do not apply for 'engines used exclusively for emergency use during involuntary loss of power' as per Reference b, Document 96.1.2 of the BAAQMD BACT Guidelines for IC Engines. Hence, the owner/operator has to the meet BACT 2 limits presented below.

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY

NOx	1. *1.5 g/bhp-hr [107 ppmvd @ 15% O_2] a,b* 2. *6.9 g/bhp-hr [490 ppmvd @ 15% O_2] a,b,c* 3. *6.9 g/bhp-hr [490 ppmvd @ 15 % O_2]*	1. *Selective Catalytic Reduction (SCR) + Timing Retard + Turbocharger w/ Intercooler a,b* 2. *Timing Retard ≤ 4º + Turbocharger w/ Intercooler a,b,c* 3. *Timing Retard ≤ 4º + Turbocharger w/ Intercooler*

The NOx emission limit set by BACT 2 is met, as shown in Table (2).

Table (2)

Pollutant	Engine Emission Factors (g/hp-hr)	Emission Factor Limits as set by BACT 2 (g/hp-hr)	Have the limits been met?
NOx	4.42	6.9	YES

Therefore, S-1 is determined to be in compliance with the BACT 2 limit for NOx.

Offsets: Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NOx. Based on the emission calculations above, offsets are not required for this application.

PSD, NSPS, and NESHAPS do not apply.

PERMIT CONDITIONS

Conditions for S-1 Emergency Generator
Application #12640, Plant #17037, Elder Care Alliance of Union City:

PC 21911

1. Hours of Operation: The owner/operator shall operate the emergency standby engine(s) only to mitigate emergency conditions or for reliability-related activities. Operating while mitigating emergency conditions is unlimited. Operating for reliability-related activities is limited to 50 hours per any calendar year. [Basis: Regulation 9-8-330]

   "Emergency Conditions" is defined as any of the following:
   a. Loss of regular natural gas supply.
   b. Failure of regular electric power supply.
   c. Flood mitigation.
   d. Sewage overflow mitigation.
   e. Fire.
   f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

   [Basis: Regulation 9-8-231]

"Reliability-related activities" is defined as any of the following:

a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
b. Operation of an emergency standby engine during maintenance of a primary motor.

[Basis: Regulation 9-8-232]

2. The owner/operator shall equip the emergency standby engine(s) with either:
   a. a non-resettable totalizing meter that measures the hours of operation for the engine; or
   b. a non-resettable fuel usage meter, the maximum hourly fuel rate shall be used to convert fuel usage to hours of operation.

   [Basis: Regulation 9-8-530]

3. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 2 years and shall make the log available for District inspection upon request:
   a. Hours of operation (total).
   b. Hours of operation (emergency).
   c. For each emergency, the nature of the emergency condition.
   d. Fuel usage for engine(s) if a non-resettable fuel usage meter is utilized.

   [Basis: Regulations 9-8-530 and 1-441]

RECOMMENDATION

Issue an Authority to Construct to the Elder Care Alliance of Union City for:

S-1 Stationary Standby Generator Set: Diesel Engine; Make: John Deere; Model: 4045HF275; Rated Horsepower: 157 HP

EXEMPTIONS

None.

By:_____ Date:_____

Raymond Salalila
Air Quality Engineering Intern